

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A pump dispenser for use with an inverted container having a downwardly-directed neck, the dispenser including a pump body to be mounted recessed into the container neck projecting into the container interior, and a plunger which is reciprocable axially relative to the pump body in a pumping stroke and has a downwardly-projecting actuating portion;

the pump body including a cylinder body defining a liquid chamber and having at its top an inlet opening for admitting liquid into the liquid chamber, and the plunger carrying a piston which is reciprocable in the cylinder body to pump liquid in use from the liquid chamber into a discharge passage and to a discharge outlet by way of a discharge valve;

an intake conduit arrangement being provided, connected to the cylinder body and defining an intake conduit extending down outside the cylinder body to connect between the inlet opening at the top of the cylinder body and an intake opening lower down, the intake opening communicating between the intake conduit and the container interior whereby in use liquid can be drawn up to the inlet opening and into the liquid chamber from an intake level lower than the inlet opening, and wherein the intake conduit arrangement comprises a conduit shell that fits over the cylinder body, defining the intake conduit by enclosing a path between itself and the cylinder body, in which the lower end of the conduit shell flares outwardly at a spacing from the pump body, an annular intake chamber is defined between the flared lower end and the pump body, and the intake opening opens into the intake chamber.

2. (Original) A pump dispenser according to claim 1 which is a foam dispenser comprising, in addition to the liquid pump constituted by said cylinder body and piston, an air pump constituted by an air cylinder also comprised in the pump body and an air piston operated by the plunger, an air chamber being defined between the air piston and the air cylinder and an air discharge passage leading from the air chamber to said discharge outlet, the liquid discharge

passage and air discharge passage meeting on the way to the discharge outlet and the resulting combined discharge passage containing a permeable foam-regulating element.

3. (Canceled)

4. (Previously Presented) A pump dispenser according to claim 1 in which the conduit shell is tubular, with a closure at its top end enclosing a top part of the intake conduit.

5. (Original) A pump dispenser according to claim 4 in which the inward surface of the conduit shell has a circumferentially-localised axially-extending groove recess between fitting wall portions, defining a channel clearance providing the intake conduit.

6. (Canceled).

7. (Previously Presented) A pump dispenser according to claim 1 in which the intake opening is at least as low as the seal engagement of the piston with the cylinder body, with the piston at its lowermost operational position.

8. (Previously Presented) A pump dispenser according to claim 18 in which the intake conduit arrangement comprises an intermediate shell which fits onto the cylinder body between the cylinder body and the conduit shell.

9. (Original) A pump dispenser according to claim 8 in which the inner shell has a top closure portion having one or more intermediate inlet openings enabling communication between the intake conduit and the cylinder body's inlet opening, the inner shell carrying an inlet valve member acting on the one or more intermediate inlet openings.

10. (Previously Presented) A pump dispenser according to claim 1 in which the inlet valve member is resiliently urged to the closed position.

11. (Previously Presented) A pump dispenser according to claim 18 in which the liquid cylinder and air cylinder are respectively upper and lower coaxial portions of a one-piece integrated cylinder unit comprised in the pump body, the liquid cylinder having a smaller bore than the air cylinder.

12. (Original) A pump dispenser according to claim 11 in which the wall of the air cylinder has a downwardly re-entrant top portion extending around the base of the liquid cylinder to form an upwardly-open trough, and a connector of the intake conduit arrangement is seated in the trough.

13. (Original) A pump dispenser according to claim 12 in which the lower end of the intake conduit shell makes a sealing engagement around the trough excepting the intake opening which is defined through the lower end of the intake conduit shell.

14. (Previously Presented) A pump dispenser according claim 18 in which the plunger has an outer wall enclosing an interior cavity and having an air intake vent, separate from the discharge passage, for entry of air to the air cylinder via the interior cavity of the plunger and an air inlet valve, and wherein the plunger outer wall has an air vent riser conduit whose entry is the external opening of the air intake vent and which extends up in the plunger to an exit opening raised from the bottom of the interior cavity.

15. (Previously Presented) A pump dispenser according to claim 18 in which the air piston engages the air cylinder at an air piston seal having a first, upwardly-directed sealing lip and a second, downwardly-directed sealing lip below the first sealing lip to stop liquid from getting into the air cylinder.

16. (Previously Presented) A pump dispenser according to claim 1 in which the discharge nozzle of the pump has a closure valve comprising a wall of a resiliently flexible material having one or more slits providing a discharge opening which is closed in a rest condition of the wall and opens when the pressure of product from the pump causes the wall to bulge outwardly.

17. (Previously Presented) A pump dispenser according to claim 1 in which the conduit shell is a one-piece molded plastics component.

18. (Currently amended) A pump dispenser for use with an inverted container having a downwardly-directed neck, the dispenser including a pump body to be mounted recessed into the container neck projecting into the container interior, and a plunger which is reciprocable axially relative to the pump body in a pumping stroke and has a downwardly-projecting actuating portion;

the pump body including a cylinder body defining a liquid chamber and having at its top an inlet opening for admitting liquid into the liquid chamber, and the plunger carrying a piston which is reciprocable in the cylinder body to pump liquid in use from the liquid chamber into a discharge passage and to a discharge outlet by way of a discharge valve;

the pump dispenser being a foam dispenser wherein, in addition to the liquid pump constituted by said cylinder body and piston, an air pump is provided constituted by an air cylinder also comprised in said pump body and an air piston operated by said plunger, an air chamber being defined between the air piston and the air cylinder and an air discharge passage leading from the air chamber to said discharge outlet, the liquid discharge passage and air discharge passage meeting on the way to the discharge outlet and the resulting combined discharge passage containing a permeable foam-regulating element;

an intake conduit arrangement being provided connected to the cylinder body and defining an intake conduit extending down outside the cylinder body to connect between the inlet opening at the top of the cylinder body and an intake opening lower down, the intake opening communicating between the intake conduit and the container interior whereby in use liquid can be drawn up to the inlet opening and into the liquid chamber from an intake level lower than the inlet opening, and wherein the intake conduit arrangement comprises a conduit shell that fits over the cylinder body, defining the intake conduit by enclosing a path between itself and the cylinder body, in which the lower end of the conduit shell flares outwardly at a spacing from the pump body, an annular intake chamber is defined between the flared lower end and the pump body, and the intake opening opens into the intake chamber.

19. (Previously Presented) A pump dispenser according to claim 18 in which the conduit shell is tubular, with a closure at its top end enclosing a top part of the intake conduit.

20. (Previously Presented) A pump dispenser according to claim 19 in which the inward surface of the conduit shell has a circumferentially-localised axially-extending groove recess between fitting wall portions, defining a channel clearance providing the intake conduit.

21. (Previously Presented) A pump dispenser according to claim 18 in which the inlet valve member is resiliently urged to the closed position.

22. (Previously Presented) A pump dispenser according to claim 18 in which the discharge nozzle of the pump has a closure valve comprising a wall of a resiliently flexible material having one or more slits providing a discharge opening which is closed in a rest condition of the wall and opens when the pressure of product from the pump causes the wall to bulge outwardly.

23. (Previously Presented) A pump dispenser according to claim 18 in which the conduit shell is a one-piece molded plastics component.

24. (New) A pump dispenser for use with an inverted container having a downwardly-directed neck, the dispenser including a pump body to be mounted recessed into the container neck projecting into the container interior, and a plunger which is reciprocable axially relative to the pump body in a pumping stroke and has a downwardly-projecting actuating portion;

the pump body including a cylinder body defining a liquid chamber and having at its top an inlet opening for admitting liquid into the liquid chamber, and the plunger carrying a piston which is reciprocable in the cylinder body to pump liquid in use from the liquid chamber into a discharge passage and to a discharge outlet by way of a discharge valve;

the pump dispenser being a foam dispenser wherein, in addition to the liquid pump constituted by said cylinder body and piston, an air pump is provided constituted by an air cylinder also comprised in said pump body and an air piston operated by said plunger, an air chamber being defined between the air piston and the air cylinder and an air discharge passage leading from the air chamber to said discharge outlet, the liquid discharge passage and air discharge passage meeting on the way to the discharge outlet and the resulting combined discharge passage containing a permeable foam-regulating element; and

an intake conduit arrangement being provided connected to the cylinder body and defining an intake conduit extending down outside the cylinder body to connect between the inlet opening at the top of the cylinder body and an intake opening lower down, the intake opening communicating between the intake conduit and the container interior whereby in use liquid can be drawn up to the inlet opening and into the liquid chamber from an intake level lower than the inlet opening, and wherein the intake conduit arrangement comprises a conduit shell that fits over the cylinder body, defining the intake conduit by enclosing a path between itself and the cylinder body, in which the intake conduit arrangement comprises an intermediate shell which fits onto the cylinder body between the cylinder body and the conduit shell.

25. (New) A pump dispenser according to claim 24 in which the intermediate shell has a top closure portion having one or more intermediate inlet openings enabling communication between the intake conduit and the cylinder body's inlet opening, the inner shell carrying an inlet valve member acting on the one or more intermediate inlet openings.

26. (New) A pump dispenser for use with an inverted container having a downwardly-directed neck, the dispenser including a pump body to be mounted recessed into the container neck projecting into the container interior, and a plunger which is reciprocable axially relative to the pump body in a pumping stroke and has a downwardly-projecting actuating portion;

the pump body including a cylinder body defining a liquid chamber and having at its top an inlet opening for admitting liquid into the liquid chamber, and the plunger carrying a piston which is reciprocable in the cylinder body to pump liquid in use from the liquid chamber into a discharge passage and to a discharge outlet by way of a discharge valve;

the pump dispenser being a foam dispenser wherein, in addition to the liquid pump constituted by said cylinder body and piston, an air pump is provided constituted by an air cylinder also comprised in said pump body and an air piston operated by said plunger, an air chamber being defined between the air piston and the air cylinder and an air discharge passage leading from the air chamber to said discharge outlet, the liquid discharge passage and air discharge passage meeting on the way to the discharge outlet and the resulting combined discharge passage containing a permeable foam-regulating element;

an intake conduit arrangement being provided connected to the cylinder body and defining an intake conduit extending down outside the cylinder body to connect between the inlet opening at the top of the cylinder body and an intake opening lower down, the intake opening communicating between the intake conduit and the container interior whereby in use liquid can be drawn up to the inlet opening and into the liquid chamber from an intake level lower than the inlet opening, and wherein the intake conduit arrangement comprises a conduit shell that fits over the cylinder body, defining the intake conduit by enclosing a path between itself and the cylinder body;

in which the liquid cylinder and air cylinder are respectively upper and lower coaxial portions of a one-piece integrated cylinder unit comprised in the pump body, the liquid cylinder having a smaller bore than the air cylinder; and

in which the wall of the air cylinder has a downwardly re-entrant top portion extending around the base of the liquid cylinder to form an upwardly-open trough, and a connector of the intake conduit arrangement is seated in the trough.

27. (New) A pump dispenser according to claim 26 in which the lower end of the intake conduit shell makes a sealing engagement around the trough excepting the intake opening which is defined through the lower end of the intake conduit shell.

28. (New) A pump dispenser for use with an inverted container having a downwardly-directed neck, the dispenser including a pump body to be mounted recessed into the container neck projecting into the container interior, and a plunger which is reciprocable axially relative to the pump body in a pumping stroke and has a downwardly-projecting actuating portion;

the pump body including a cylinder body defining a liquid chamber and having at its top an inlet opening for admitting liquid into the liquid chamber, and the plunger carrying a piston which is reciprocable in the cylinder body to pump liquid in use from the liquid chamber into a discharge passage and to a discharge outlet by way of a discharge valve;

the pump dispenser being a foam dispenser wherein, in addition to the liquid pump constituted by said cylinder body and piston, an air pump is provided constituted by an air cylinder also comprised in said pump body and an air piston operated by said plunger, an air chamber being defined between the air piston and the air cylinder and an air discharge passage leading from the air chamber to said discharge outlet, the liquid discharge passage and air discharge passage meeting on the way to the discharge outlet and the resulting combined discharge passage containing a permeable foam-regulating element; and

an intake conduit arrangement being provided connected to the cylinder body and defining an intake conduit extending down outside the cylinder body to connect between the inlet opening at the top of the cylinder body and an intake opening lower down, the intake opening communicating between the intake conduit and the container interior whereby in use liquid can be drawn up to the inlet opening and into the liquid chamber from an intake level lower than the inlet opening, and wherein the intake conduit arrangement comprises a conduit shell that fits over the cylinder body, defining the intake conduit by enclosing a path between itself and the cylinder body, in which the plunger has an outer wall enclosing an interior cavity and having an air intake vent, separate from the discharge passage, for entry of air to the air cylinder via the interior cavity of the plunger and an air inlet valve, and wherein the plunger outer wall has an air

vent riser conduit whose entry is the external opening of the air intake vent and which extends up in the plunger to an exit opening raised from the bottom of the interior cavity.

29. (New) An apparatus, comprising:

an inverted foaming dispenser for dispensing foam, the dispenser including

an air cylinder with an air piston to pump air to form the foam,

a liquid cylinder extending from the air cylinder, the liquid cylinder having a liquid piston to pump liquid to form the foam, the liquid cylinder having an inlet opening at an end opposite the air cylinder for drawing the liquid into the liquid cylinder,

the air cylinder having a trough around the liquid cylinder, and

a conduit shell fitted over the liquid cylinder to define an intake conduit, the conduit shell extending along the liquid cylinder from the inlet opening to the trough for drawing the liquid from the trough to the inlet opening via the intake conduit.

30. (New) The apparatus of claim 29, in which the conduit shell has an outwardly flared portion that flares outwardly from the pump body.

31. (New) The apparatus of claim 30, in which the outwardly flared portion includes a radial surface that is flattened.

32. (New) The apparatus of claim 31, further comprising:

the trough having a snap bead; and

the outwardly flared portion having a snap ring engaged to the snap bead.

33. (New) The apparatus of claim 32, in which the radial surface has one or more through-openings.

34. (New) The apparatus of claim 30, further comprising:

the trough having a snap bead; and

the outwardly flared portion having a snap ring engaged to the snap bead.

35. (New) The apparatus of claim 30, further comprising:
the trough having a snap bead; and
the conduit shell having a snap ring engaged to the snap bead.
36. (New) The apparatus of claim 29, further comprising:
the conduit shell including a radial surface that is flattened at the trough.
37. (New) The apparatus of claim 36, in which one or more through-openings
facilitate entry of the liquid into the trough.
38. (New) The apparatus of claim 36, in which the conduit shell has an outwardly
projecting channel with an intake channel, the intake channel extending along the liquid cylinder
and through the radial surface that is flattened at the trough to draw the liquid from the trough to
the inlet opening.
39. (New) The apparatus of claim 29, in which the conduit shell has an outwardly
projecting channel with an intake channel to draw the liquid from the trough to the inlet opening.
40. (New) The apparatus of claim 29, further comprising:
an intermediate shell disposed between the conduit shell and the liquid cylinder.
41. (New) The apparatus of claim 40, in which the intermediate shell includes an
umbrella valve.